IOJPE

ISSN: 1300 – 915X
www.iojpe.org

International Online Journal of Primary Education *2021, volume 10, issue 1*

INVESTIGATION OF VERBS USED BY PRE-SERVICE PRIMARY SCHOOL TEACHERS IN THE CONTEXT OF HIERARCHY OF NEEDS WITH THE SOM-WARD METHOD

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Received: June 04, 2020 **Accepted:** February 24, 2021 **Published:** June 30, 2021

Suggested Citation:
Yazar, I., Hazar, D., Keşan, C., & Özer, M. (2021). Investigation of verbs used by pre-service primary school teachers in the context of hierarchy of needs with the SOM-Ward method. *International Online Journal of Primary Education (IOJPE), 10*(1), 235-250.

Abstract

The current study examines the verbs used by pre-service primary school teachers in everyday language in the context of the hierarchy of needs using the SOM-Ward clustering method. The study group of this survey research consists of 271 pre-service primary school teachers studying at a public university in Turkey. In this research, pre-service primary school teachers were asked to list the most 10 frequently used verbs in everyday language. Descriptive analysis was conducted by coding the verbs according to the themes of the hierarchy of needs. The intercoders reliability was calculated as 96 percent. The mean ranks were calculated on the data obtained according to this coding. Through the SOM-Ward clustering analysis, it was observed that the pre-service primary school teachers were separated into four clusters. Although not hierarchic, the C1 cluster is compatible in terms of basic needs; biological and physiological needs were preferred, and then the personal preferences of individuals were prioritized in determining the needs. Individual preferences prevent the hierarchical approach in determining the needs of the C2-C3-C4 clusters; it was seen that the love, safety and the aesthetic needs of those who formed these clusters are far greater than their basic needs. This reveals that there may be greater and higher priority life needs than biological and physiological needs in an individual. In addition, it was determined that the needs of esteem and superiority shown in the pyramid did not play a decisive role in the clusters since they did not make a significant impact.

Keywords: SOM-Ward analysis, verb, hierarchy of needs, primary school.

INTRODUCTION

Language is accepted as the greatest ability that people acquire unconsciously and also it is a nested system which is shaped by the communities. The communities use it, and the language forms the basis of the agreements that society considers appropriate. Although the carrier characteristics of the common culture come to the fore in the formation of this basis, it is not possible to explain many differences regarding the use of language within the same cultural structure by using a random approach. As a result of the combination of human creativity and flexibility brought by individual language, which is unique

to the person, emerging of these differences is quite normal in terms of daily language. The language usage patterns of each individual in every society throughout history have been different. These forms of use contain many clues that have not been explicitly stated but noticed about the individual using them. Signs such as the spoken words, the chosen words, and the phonetic and morphological features of the language produced are included as aids which identify the language user. For example, while speaking on the phone, it is possible to make inferences about the speaker's age, gender, mood, education level, society in which he grew up, and culture, even if the speaker himself does not say these things. In this regard, the examination and understanding of the differences in everyday language use are primarily related to the knowledge of the individual who uses the language and the language used.
In today's world, it is seen that studies are conducted for the different uses and subtleties of language, and functional features of a language are emphasized in this context. Within this approach, language is seen as a part of daily activities and evaluated in these relations. Everyday linguists study language considering variables such as the orientation and actions of the speaker and the listener. Austin (2009) mentions that this language, which is used for everyday purposes such as betting, has an indispensable value for human life since everyday language has a long historical background and it uses the features of everyday language for different purposes while making various distinctions in the historical process (Austin, 2009, p. 16). It is seen that human beings can distinguish the male from the female, the living being from the abiotic, the friend from the enemy, and the good from the bad, thanks to daily language, which is one of the most natural elements as a means of communication in its great variety of forms in the universe of life. These distinctions, which extend almost to infinity in everyday language, are not without reason and support. In every distinction and awareness created, humanity's everlasting worldly efforts have a purpose, reflection and trace (Çelebi, 2014, p. 74-77).

In our study, while evaluating the factors related to individual's daily language, basic needs and analyses related to Maslow's classification were taken into consideration, rather than reasons such as mental association, socio-economic status or educational level differences. Because human beings exist in the historical process, they continue their lives as social beings in relation to the dynamic structure and perception of the value of the society they live in today. The individual has been living in a programmed way from the first moment he was born in order to meet his needs and to adapt to the conditions of his universe. Especially, the feeling of hunger in the first moment the individual opens his eyes to the world clearly shows the individual's need for nutrition. Vital findings reveal the unlimited efforts of the individual to meet their needs from birth to death. The individual, who must meet his needs due to his physiological structure, must live in production and consumption to fulfill the requirements that have a vital function for life. From past to present, individuals have been trying to meet their needs primarily to produce and consume. In this context, since the individual must meet his physiological needs, s/he focuses primarily on basic needs such as nutrition and shelter. Besides physiological needs, needs such as security, love, esteem and self-actualization are among the goals that the individual wants to achieve. Today, no matter how unlimited the individual's needs are, human beings can only meet their needs at a certain level according to their situation. For example, while the primary need for a child living in Africa is only nutrition, the needs in different geographies may reflect different variables.

The individual fulfills his needs in certain steps. It is not expected for the individual to meet the need for security or love and esteem without fulfilling the need for nutrition and shelter. In this regard, Maslow has made some insights by creating a hierarchy of needs. According to these findings, it was underlined that each goal determined in the context of the hierarchy of needs is related to the other, and the target or need that has the best probability in this context is a preliminary step that must be fulfilled in the required conditions. According to Maslow, it is predicted that the individual who meets the needs or needs at any step will be satisfied with the target in the next step of the hierarchy. In this context, in terms of the hierarchy of needs, the individual cannot move to the need for security without meeting his physiological needs. This situation also reveals that the needs of individuals are conducted in steps (Shi & Lin, 2021; Toker, 2007, p. 94-95; Walsh, 2011, p. 791).

The hierarchy of needs was originally introduced as a five-step structure including "physiological-biological needs, security needs, love-belonging needs, esteem needs and self-actualization," but over time, it was transformed into an eight-step structure with the addition of "cognitive needs, aesthetic needs and transcendence" (Maslow, 1970, p. 176). Physiological-biological needs are our basic needs such as food, water, air, sleep, warming and reproduction, which are necessary for us to continue our lives. These needs are more important than any other needs. The need for security means safety/security so we can survive; we need a home, a neighborhood, an economy, and our health security. The feeling of being loved, accepted, the desire to belong, and the need to be alone are included in the step of the needs for love-belonging. These needs are met by friendship, family relationships, and membership in social groups. Every person should feel valued, respected and confident. These esteem needs are met by participating in social activities, acquiring hobbies, and achieving academic success. The need for self-actualization is the state of self-realization of the person completely. Realizing every need may bring about the state of being. For a person to do this, they must have fulfilled their above needs completely. With these determinations, Maslow contributed to psychology by directing the attention to the positive aspects of human nature, aspects which give mental health and focus on human potential (Kleinman, 2014, p. 137-142). However, differences can be put forward in the hierarchy of needs for each culture because the situation of providing priority for the needs and their satisfaction caused by different cultures or significantly differentiating environmental adaptation problems may change the priority of advancement in the steps of the hierarchy of needs (Abdullah & Gallagher, 1995; Hagerty, 1998; Hofstede, 1980; Martinez, 2020; Montag, Sindermann, Lester, & Davis, 2020; Nevis, 1983, Rama, Harris, Speegle, Nelson, Moen, & Harris, 2020; Taormina & Gao, 2013; Ye, Ng, & Lian, 2015). For example, the Chinese hierarchy of needs is composed of belonging, physiology, safety, self-actualization in the service of society, respectively, as explained by Nevis (1983). While Maslow's hierarchy of needs stems from Western culture and focuses on the inner needs of individuals, the Chinese hierarchy of needs stems from Eastern culture and focuses on requirements of the social order (Awanis, Schlegelmilch, & Cui, 2017; Nevis, 1983; Scheffer & Heckhausen, 2018; Schwartz, 1990). Different ethnic groups in Iran emphasized basic needs, esteem needs, and self-actualization as interpreted by Mousavi and Dargahi (2013).

The individual primarily uses the communication elements in meeting his needs. This process, which starts with body language communication with the individual's arrival in the world, moves to verbal communication in proportion to psycho-motor and physical developments over time, and written communication channels can be used eventually. The ability of the individual to use language proficiency in expressing himself is extremely important.

Today, generations that grow up in the age of information and communication, adopting the technology-oriented life philosophy can reveal negative results in the development of language skills. The increase in the number of digital natives who are unable to express their troubles, explain their curiosity and have difficulty in putting together three or five sentences because of the onset of the information age may be among the most important problems of societies in this century. This situation should be evaluated as a corruption, both in the individual and in the culture of a society. Together with the changing world, our needs also change. According to Nair (2020), the hierarchy of needs for the 21st century is composed of physiological needs, psychological needs, spiritual needs, self-esteem and existential needs.

In this context, this study is important because it determines and expresses individual needs of pre-service primary school teachers, uses different language skills such as reflection and presentation, and shows what language proficiency and everyday language vocabulary mean to the individual and how much these things are kept in mind and how and to what extent they can be used.

The verbs we use during conversation find a parallel in the different steps in the eight-tier structure of the hierarchy of needs. For example, while the verbs of hunger and shopping show the behaviors of the biological-physiological need level, understanding is an example of the behaviors of the aesthetic needs level and dancing is an example of the cognitive needs level.

The verbs that individuals use in everyday language and the existence of clusters with similar characteristics according to these verbs are questioned within the scope of this research. When the verbs are evaluated according to Maslow's hierarchy of needs, what behaviors are seen in clusters with similar characteristics, their usage frequency, and their hierarchical structures are also revealed.

SOM-Ward Clustering Method

Self-Organizing Maps (SOM) is an effective software tool in which the results obtained using nonlinear relations between the multi-dimensional input data and the geometric connections between the data are usually converted into two-dimensional images. This method can also be considered an abstraction process, as it shortens information while preserving the most important topological-metric properties of key data components. The process consists of visualization and abstraction stages in which complex processes such as process analysis, machine detection, control and communication are evaluated (Kohonen, 1990).

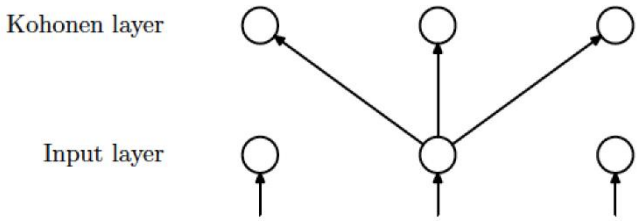


Figure 1. SOM structure

As shown in Figure 1, SOM consists of two interconnected layers, the input layer and the Kohonen layer. The number of neurons in the input layer is equivalent to the number of attributes of the objects, and each neuron in the input layer has a feedforward link with every neuron in the Kohonen layer. After the input data are normalized, inputs are calculated in the Kohonen layer with $y_j = \sum_{i=1}^{d} w_{ji} x_i$. Here w_{ji} is the weight value of the communication from the input neuron at i to the output neuron at j in the Kohonen layer. Under a winner-takes-all paradigm, the neuron in the Kohonen layer with the biggest y_j value will be chosen as the winner neuron (Gan, Ma, & Wu, 2007). The SOM algorithm starts by being initialized with all the connection weights in the network having small random values. Then, the algorithm continues with the competition, cooperation and adaptation processes (Haykin, 1999).

In the competition process, an object is randomly selected from the input layer $x = (x_1, x_2, \dots, x_d)^T$ (d is the size of the input layer). d^* is the total number of neurons in the Kohonen layer, and the weight vector of the neuron at the j in the Kohonen layer is determined by $w_j = (w_{j1}, w_{j2}, \dots, w_{jd^*})^T, j = 1,2, \dots, d^*$. The winner neuron of the input object is denoted by $i(x) = \arg min \|x - w_j\|, 1 \le j \le d^*$.

The collaboration process is the process of determining the topological neighborhood so that the winner neuron is at the center of collaborative neurons. The winning neuron is t, and its topological neighborhood is determined by $h_{j,t}$. $d_{t,j}$ is shown as the distance between the winner neuron t and the stimulated neuron j.

$h_{j,t}$ is the symmetry of the maximum point defined by $d_{t,j} = 0$. The width of $h_{j,t}$ decreases regularly compared to the adjacent neighborhood of $d_{t,j}$ and drops to zero in the case of $d_{t,j} \to \infty$. The lateral distance is defined by $d_{t,j} = |t - j|$ in lattice. r_t and r_j are discrete vectors that determine the positions of the stimulated neuron t and the winner neuron j in the two-dimensional lattice model, and the adjacent neighborhood of $d_{t,j}$ is determined by $d_{t,j} = \|r_t - r_j\|$.

In the adaptation process, w_j that is the weight vector of the neuron j varies according to input object x. When the learning rate parameter is $\eta(s) = \eta_0 \exp\left(-\frac{s}{\tau_2}\right), s = 0,1,2, \dots$ and $\sigma(s) = \sigma_0(-\frac{s}{\tau_1})$, the neighborhood function is defined as $h_{ij(x)}(s) = \exp\left(-\frac{d^2_{i(x),j}}{2\sigma^2(s)}\right), s = 0,1,2, \dots$. If the given weight vector of

neuron j is $w_j^{(s)}$, the new weight vector is determined by $w_j^{(s+1)} = w_j^{(s)} + \eta(s)h_{ij(x)}(s)(x - w_j^{(s)})$. Constants can be taken as $\eta_0 = 0.1, \sigma_0 = lattice\ radius, \tau_1 = \frac{1000}{\log \sigma_0}, \tau_2 = 1000$ (Haykin, 1999).

The current study works to order pre-service primary school teachers by their overall similarity according to the verbs they use most frequently in daily life. For this purpose, the verbs used by pre-service primary school teachers in daily life were evaluated according to Maslow's hierarchy of needs. The most frequently used hierarchy steps in daily life were determined according to the verbs evaluated by using Maslow's hierarchy of needs. Pre-service primary school teachers with similar characteristics were divided into clusters using the nonparametric regression method. Thus, the study aims to determine needs most frequently expressed by pre-service primary school teachers in Turkish culture today and to examine the characteristics of the groups formed according to the priority of the needs. This study is important in terms of examining the needs and priorities shaped by cultures, especially changing Turkish culture, and analyzing the characteristics of the pre-service primary teacher groups that have been ordered by overall similarity concerning prior needs.

METHOD

The research examines the groups formed by those who have similar characteristics, classifying the data obtained according to the hierarchy of needs by identifying the verbs used in daily life by students studying in the primary school teaching program. In this context, the study is a survey study. Field survey studies are conducted to determine the current status of the event or problem to be investigated (Çepni, 2018). The survey method requires a sample, data collection, data analysis, and construction of quantitative descriptors of the sample of study (Groves, Fowler, Couper, Lepkowski, Singer, & Tourangeau, 2009).

Study Group

The study group of the research consisted of 271 undergraduate students studying in a public university in the faculty of education in the primary school teaching program.

Data Collection Tool

"Write down the top ten verbs you use most frequently in your daily life in order of priority." was the instruction given to the students. They wrote the most frequently used verbs in daily life from first to tenth. The implementation of the data collection tool took about 20 minutes. When the data were examined, those who did not write ten of the most frequently used verbs in daily life were not taken into consideration, and the first ten verbs of those who wrote more than ten were evaluated.

Data Analysis

The data, that is, the verbs that students use in daily life, are classified themes according to the steps of the hierarchy of needs. Descriptive analysis was performed. The coding process for the themes determined according to Maslow was carried out independently by five researchers who are experts in their field. The reliability coefficient that shows the internal validity between coders was calculated using the formula $\Delta = \mathrm{C} \div (\mathrm{C} + \partial) \times 100$ (Miles & Huberman, 1994). Here, Δ refers to the coefficient of reliability, C is the number of terms with which consensus is reached, ∂ is the number of terms with which there is no consensus. The adjustment among coders is expected to be at least 80% (Patton, 2002). As a result of the calculations, it was seen that the percentages of adaptation ranged between 51 and 96 percent and the highest compliance percentage of coders was used. The explanation of the themes is given in Table 1.

Table 1. Themes (Maslow, 1970)

Theme	Explanation
Biological and physiological needs	Air, food, water, shelter, temperature, sexuality, sleep
Security needs	Protection from natural events, safety, order, law, stability, fearlessness
Love and belonging needs	Friendship, sincerity, trust and acceptance, love and interest exchange, attachment, belonging to a group (family, friend, work)

Esteem needs	(i) Self-respect (dignity, success, mastery, independence) and (ii) the desire to be respected by others (for example, position, prestige)
Cognitive needs	Knowledge and understanding, curiosity, discovery, search for meaning and predictability
Aesthetic needs	Seeking beauty and knowing its value, balance, shape, etc.
Self-actualization	Realizing personal potential, striving for personal satisfaction, personal development and culmination
Transcendence	The individual is motivated by values beyond his own self (mystical and certain experiences related to nature, aesthetic experiences, sexual experiences, service to others, science engagement, religious belief, etc.)

These themes were then coded numerically for each student's answer, respectively. Some examples of these coding are in Table 2.

Table 2. Examples of themes

Theme	**Examples**			
Biological and physiological needs	to be hungry	to cry	to touch	to handwash
Security needs	to keep up	to cheat	to kill	to escape
Love and belonging needs	to appreciate	to fall in love	to be moved	to break up
Esteem needs	to arrange			
Cognitive needs	to understand	to express	to know	to explore
Aesthetic needs	to paint	to do personal care	to draw	to brush hair
Self-actualization	to play basketball	to go to events	to read news	to learn English
Transcendence	to pray	to render	to break the fast	to do sahur*

(* Sahur means a meal before dawn during Ramadan)

The numerical data of five students, which are coded according to the high compatible coding of researchers being expert in their fields, are shown in Table 3:

Table 3. Examples of coding

Student	**A1**	**A2**	**A3**	**A4**	**A5**	**A6**	**A7**	**A8**	**A9**	**A10**
S1	1	1	1	1	3	5	1	6	1	1
S2	1	1	1	1	3	2	7	1	1	5
S3	2	1	1	1	2	5	1	2	1	1
S4	1	1	1	2	1	1	5	1	3	2
S5	1	1	2	1	1	1	1	1	1	7

The numbers 1-8 refer to the biological and physiological needs theme, security needs theme, love and belonging needs theme, esteem needs theme, cognitive needs theme, aesthetic needs theme, self-actualization theme and transcendence theme in Table 3, respectively. To make the data mathematically meaningful, the mean ranks of the answers were calculated. The answers given by each student are coded according to the themes. As an example, the codes of the five students are as in Table 3. Then, the rows with the codes in each student (in each line) were added, and the data were calculated as in Table 4. For example, in Table 3, the columns representing the order in which theme 1 is in line S1 are calculated as 1 + 2 + 3 + 4 + 7 + 9 + 10=36 and expressed in Table 4.

Table 4. Rank sum

Student	**Biological and physiological needs**	**Security needs**	**Love and belonging needs**	**Esteem needs**	**Cognitive needs**	**Aesthetic needs**	**Self actualization**	**Transcendence**
	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8
S1	36	0	5	0	6	8	0	0
S2	27	6	5	0	10	0	7	0
S3	35	14	0	0	6	0	0	0
S4	25	14	9	0	7	0	0	0
S5	42	3	0	0	0	0	10	0

Then, how many times the student wrote each theme (in each line) was calculated according to Table 3 (Table 4). For example, the first student wrote verbs on theme 1 in seven rows, no verb was written for themes with codes 2, 4, 7, and 8 and one verb was written for themes with codes 3, 5, and 6. As a result, the first row of Table 5, 7,0,1,0,1,1,0,0, respectively, was calculated. These calculations were made for other students and the data of the first five students are shown in Table 5.

Table 5. Number of themes

Student	Biological and physiological needs	Security needs	Love and belonging needs	Esteem needs	Cognitive needs	Aesthetic needs	Self actualization	Transcendence
	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8
S1	7	0	1	0	1	1	0	0
S2	6	1	1	0	1	0	1	0
S3	6	3	0	0	1	0	0	0
S4	6	2	1	0	1	0	0	0
S5	8	1	0	0	0	0	1	0

Then, the rank-sum values in Table 4 were divided by the number of themes in Table 5 and the mean ranks of themes were obtained and is shown in Table 6. Instead of undefined values (0 ÷ 0), 0 was written.

Table 6. Mean rank of themes

Student	Biological and physiological needs	Security needs	Love and belonging needs	Esteem needs	Cognitive needs	Aesthetic needs	Self actualization	Transcendence
	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8
S1	5.142857	0	5	0	6	8	0	0
S2	4.5	6	5	0	10	0	7	0
S3	5.833333	4.666667	0	0	6	0	0	0
S4	4.166667	7	9	0	7	0	0	0
S5	5.25	3	0	0	0	0	10	0

For the answers given by students to be meaningful in accordance with the order (since ten answers were given), each numerical value was subtracted from 11 and made ready for analysis. The first five students belonging to these data are shown in Table 7.

Table 7. Optimized data for analysis

Student	Biological and physiological needs	Security needs	Love and belonging needs	Esteem needs	Cognitive needs	Aesthetic needs	Self actualization	Transcendence
	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8
S1	5.857143	0	6	0	5	3	0	0
S2	6.5	5	6	0	1	0	4	0
S3	5.166667	6.333333	0	0	5	0	0	0
S4	6.833333	4	2	0	4	0	0	0
S5	5.75	8	0	0	0	0	1	0

All these calculations are done in Excel. SOM-Ward cluster analysis was applied to the data obtained from Excel using the Viscovery SOMine program.

The SOM-Ward method, one of the nonparametric regression techniques, creates a nonlinear representation of data distribution by reducing multidimensional data spaces to lower dimensions and helps define visually homogeneous data groups (Augustin et al., 2018). Pre-service primary school teachers were ordered by their overall similarity regarding their frequently used verbs coded according to the hierarchy of needs. Clusters were generated by using SOM-Ward cluster analysis. Converting into lower-dimensional abstraction process was carried out by using the two-sided t-test with a confidence

of 95% to identify each cluster of all pre-service primary teacher characteristics that differ significantly from the study sample. Thus, we can see visual clusters with homogeneous data. Viscovery also automatically calculated the absolute profile median, frequency, mean, standard deviation for quantitative variables, percentage for discrete variables, t-test scores, and p-value for the t-test.

RESULTS

As a result of the analyses, there are four clusters that show similar characteristics with the pre-service primary school teachers' daily life verbs coded according to the hierarchy of needs. These clusters are named C1, C2, C3, and C4. The number (N), absolute profile median, frequency, and mean of the eight themes in these four clusters are shown in Table 8:

Table 8. Characteristics of clusters

	N	Absolute profile median	Frequency	x_1	x_2	x_6	x_7	x_3	x_5	x_4	x_8
C1	123	.3223	45.39	6.211	1.95	.09	3.60	.54	2.50	.00	.016
C2	74	.3680	27.31	5.348	7.42	.05	2.51	.74	3.58	.122	.34
C3	63	.9620	23.25	5.926	4.00	.07	1.70	6.44	2.31	.00	.00
C4	11	2.4844	4.05	5.669	2.03	5.91	3.27	1.82	2.82	.00	.00

Through processing the data in SOM-Ward analysis, 45.93, 27.31, 23.25 and 4.06 percent constituted C1, C2, C3, and C4 clusters, respectively. With the map obtained from SOM-Ward analysis, the sequence of verbs of the students also reveals in which cluster they will occur. The map of the clusters is given in Figure 2.

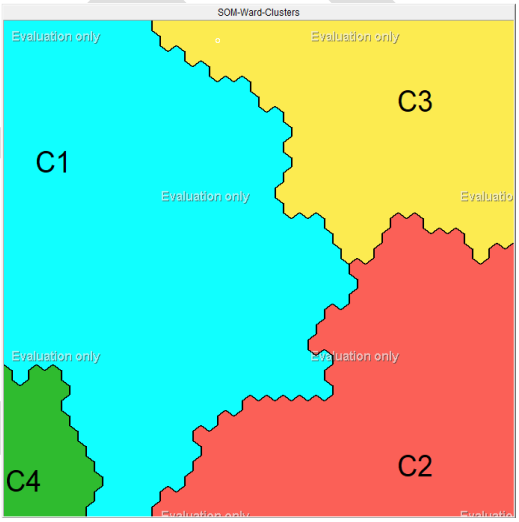


Figure 2. SOM-Ward cluster map

Table 9. Analysis results of C1

	Mean	Std.Dev.	Diff. mean	Profile	p	t-test
x_1	6.211	.75	5.5	.3223	.00	5.053
x_2	1.95	2.13	-50.3	-.6149	.00	11.13
x_6	.09	.41	-71.3	-.1739	.0088	2.639
x_7	3.60	2.96	26.4	.2617	.0001	4.038
x_3	.54	1.34	-73.1	-.5099	.00	8.63
x_5	2.50	3.15	-9.5	.0836	.2105	1.255
x_4	.00	.00	-100	-.0607	.3629	.9114
x_8	.016	.180	-83.8	-.1032	.1218	1.552

Table 10. Cluster profile values of C1

Characteristic Attribution	Profile Value	Mean of Cluster	Cluster Profile Comparison

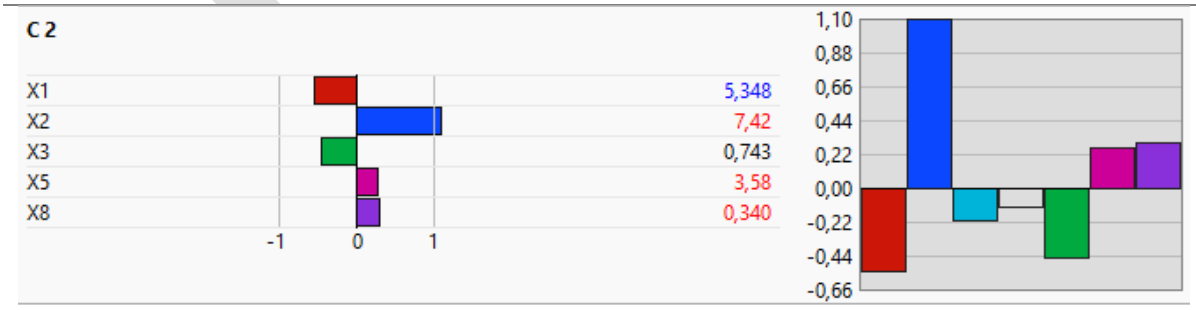
The largest cluster is C1. This cluster with 123 students constitutes 45.93 percent of the entire sample. Analysis results for each attribute in cluster C1 are in Table 9. The calculations here are calculated at the level of p=.05 (95%) significance. According to the t-test, the hierarchy of needs levels with p <.05 (x_1, x_2, x_3, x_6, x_7) were the features that differ significantly from the sample of the whole study while determining the characteristics of the C1 cluster. When the situations with p<.05 are evaluated, the verbs regarding biological-physiological needs (x_1), self-actualization (x_7), security needs (x_2), aesthetic needs (x_6) and the need for love-belonging (x_3) in the cluster are significantly different from other clusters. According to the profile value comparison in Table 10, it is seen that while biological-physiological needs and the need for self-actualization are positively distinct, the need for safety, aesthetics and love-belonging are negatively distinct in C1. Therefore, it is seen that the C1 cluster is composed of students who use verbs for biological-physiological and self-fulfillment needs more frequently and use verbs less often for the need for safety, aesthetic needs and love-belonging.

Table 11. Analysis results of C2

	Mean	Std.Dev.	Diff. mean	Profile	p	t-test
x_1	5.348	.859	-9.2	.5362	.00	5.719
x_2	7.42	1.92	89	1.0894	.00	14.76
x_6	.05	.23	-82.7	-.2016	.0417	2.046
x_7	2.51	2.96	-12	-.1184	.2329	1.196
x_3	.74	1.58	-63.2	-.4413	.0000	4.618
x_5	3.58	3.20	29.5	.2604	.0084	2.657
x_4	.122	1.046	266.2	.1617	.1029	1.637
x_8	.340	1.522	239.3	.2946	.0028	3.017

Table 12. Cluster profile values of C2

Characteristic Attribution	Profile Value	Mean of Cluster	Cluster Profile Comparison



C2 is the second largest cluster of the sample. This cluster, which has 73 students, constitutes 27.31 percent of the sample. The analysis results for each attribute in the C2 cluster are shown in Table 11. According to the t-test, the hierarchy of needs levels with p<.05 (x_1, x_2, x_3, x_5, x_6, x_8) were the features

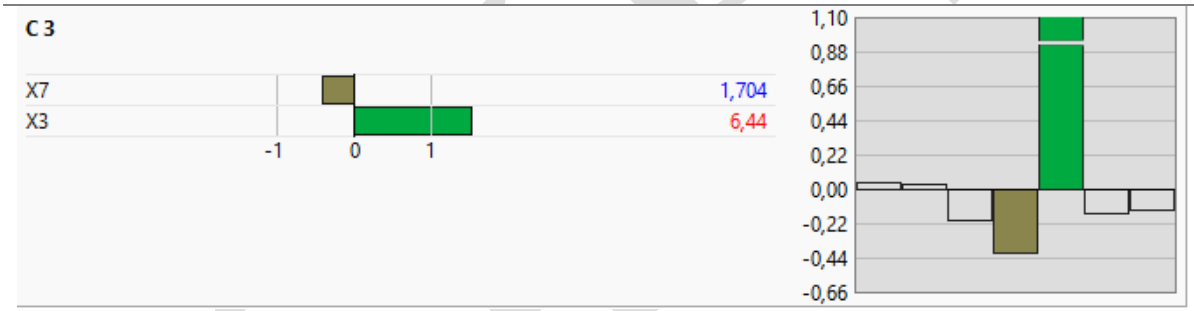
that differ significantly from the sample of the whole study while determining the characteristics of the C2 cluster. The calculations here are calculated at the level of p=.05 significance. Verbs regarding biological-physiological needs, safety needs, aesthetic needs, love and belonging needs, cognitive, and transcendence needs were significantly determinative in C2 (p<.05). When the profile value comparison is considered in Table 12, while the security needs, cognitive needs and transcendence were positively effective, biological and physiological needs, aesthetic and love-belonging needs came out as negative in C2. From this viewpoint, student teachers in the C2 cluster use verbs more frequently for security needs, cognitive and transcendence needs but fewer verbs for biological and physiological needs, aesthetic needs and love-belonging needs.

Table 13. Analysis results of C3

	Mean	Std.Dev.	Diff. mean	Profile	p	t-test
x_1	5.926	1.253	.7	.0383	.7290	.3469
x_2	4.00	2.75	2	.0242	.8271	.2186
x_6	.07	.28	-77.1	-.1880	.0885	1.709
x_7	1.70	2.13	-40.2	-.3978	.0003	3.687
x_3	6.44	1.74	218.7	1.5261	.0000	25.54
x_5	2.31	2.81	-16.5	-.1457	.1874	1.322
x_4	.000	.000	-100.0	-.0607	.5830	.5496
x_8	.000	.000	-100.0	-.1231	.2654	1.116

Table 14. Cluster profile values of C3

Characteristic Attribution	Profile Value	Mean of Cluster	Cluster Profile Comparison
C 3			
X7		1,704	
X3		6,44	



C3 is the third-largest cluster of the sample. This cluster, with 63 students, constitutes 23.25 percent of the sample. The analysis results for each attribute in the C3 cluster are shown in Table 13. According to the t-test, the hierarchy of needs levels with p<.05 (x_3, x_7) were the features that differ significantly from the sample of the whole study while determining the characteristics of the C3 cluster. Verbs regarding the need for self-realization and love-belonging were significative in the C3 cluster (p <.05). According to the profile value comparison in Table 14, it is seen that the verbs for the love-belonging need are positively while self-fulfillment needs are negatively decisive in the C3 cluster. It is seen that C3 consists of students who use verbs for the love-belonging needs of the C3 cluster more frequently and use fewer verbs for the need of self-realization.

Table 15. Analysis results of C4

	Mean	Std.Dev.	Diff. mean	Profile	p	t-test
x_1	5.669	1.315	-3.7	-.2168	.4638	.7336
x_2	2.03	2.55	-48.3	-.5911	.0451	2.013
x_6	5.91	2.30	1795.1	4.3777	.0000	34.29
x_7	3.27	2.83	14.9	.1481	.6170	.5006
x_3	1.82	2.40	-10.1	-.0704	.8121	.2379
x_5	2.82	3.57	1.9	-.0168	.9549	.0566
x_4	.000	.000	-100.0	-.0607	.8375	.2053
x_8	.000	.000	-100.0	-.1231	.6775	.4163

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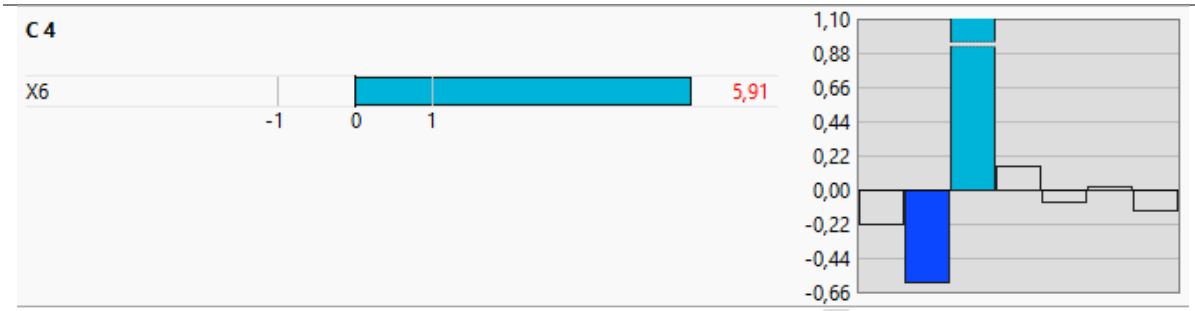
Table 16. Cluster profile values of C4

Characteristic Attribution	Profile Value	Mean of Cluster	Cluster Profile Comparison
C 4			
X6		5,91	



C4 is the last set of the sample. This cluster, which has 11 students, constitutes 4.06 percent of the sample. The analysis results for each attribute in C4 are found in Table 15. According to the t-test, the hierarchy of needs levels with $p<.05$ (x_6) was the feature that differs significantly from the sample of the whole study while determining the characteristics of the C4 cluster. The verbs-regarding the safety and aesthetic needs in C4 were significant ($p<.05$). When the profile value comparison in Table 16 is examined, it is seen that the verbs for aesthetic needs are positively decisive in C4, while the verbs for safety needs are negatively decisive. It is seen that it consists of students using verbs more frequently for aesthetic needs and using fewer verbs for security needs in C4.

These clusters are examined according to the hierarchy of needs in the following figures. The distribution of clusters according to biological-physiological needs is shown in Figure 3:

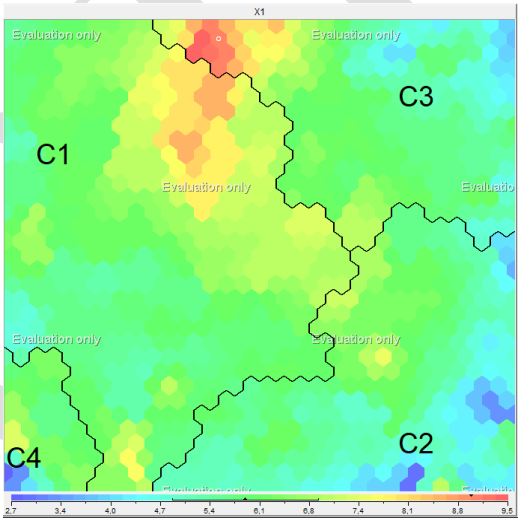


Figure 3. The distribution of verbs for biological physiological needs in clusters.

According to Figure 3, it is seen that the frequency of use of verbs for biological-physiological needs is indicated in green in all clusters. Regions marked in blue in C2, C3, C4 show the frequency of use is low. This situation also lowers the mean of the cluster. It has been shown with the statistical data above those verbs for these needs are more decisive in C1. Frequent use of verbs for biological-physiological needs in all clusters (i.e., all students) is compatible with being the first step of Maslow's hierarchy of needs.

In Figure 4, the red and green regions show that verbs for security needs are used less often in C1, while they are used more frequently in C2. Verbs for security needs are more decisive in C2 as shown (Figure 4). Security needs are felt the most intensely and take priority in C2, while they are at the lowest level in the C1 and C4 clusters.

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When Figure 5 is examined, it can be understood from the intensity of the blue colors that the verbs for love-belonging needs are used less frequently in clusters C1, C2 and C4; however, the intensity of the green and red colors shows they are used more frequently in C3. It is seen that students who use the verbs for their love-belonging needs more frequently are significantly effective in forming C3.

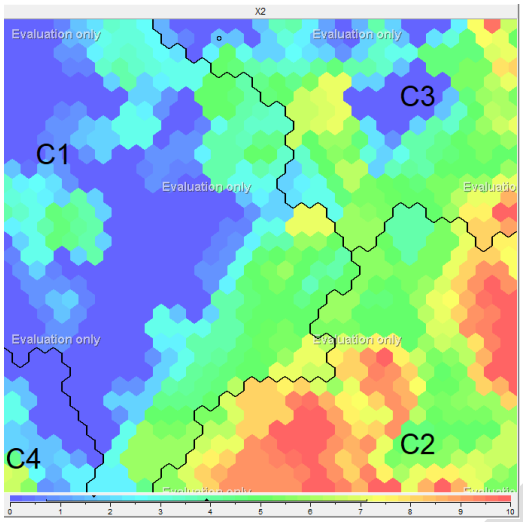

Figure 4. The distribution of verbs for security needs in clusters.

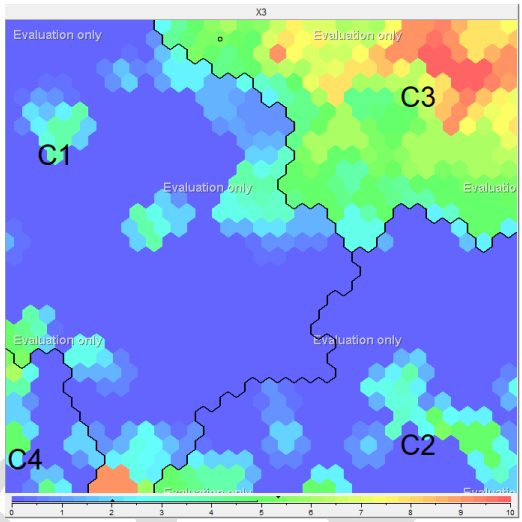

Figure 5. The distribution of verbs regarding love-belonging needs in clusters.

When Figure 6 is examined, it is seen that verbs for respect needs are not used frequently by the students in the sample. This situation is the same in all clusters, and verbs for this theme have not been decisive in the formation of clusters. It has been observed that verbs related to respect needs are not used frequently in students' daily lives.

When Figure 7 is examined, it can be seen that the verbs for cognitive needs are used in all clusters at low and medium levels, and frequently used by students in the C1 and C2 clusters (displayed in red). Considering the mean and descriptive statistics of the clusters in themselves (Tables 11-12), it is seen that verbs for this theme play an important role in the formation of C2.

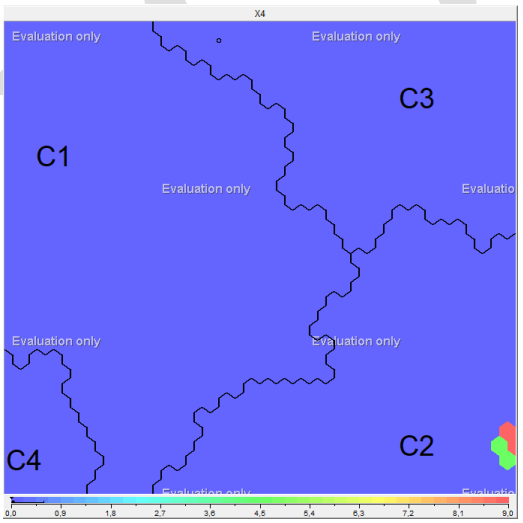

Figure 6. The distribution of verbs for esteem needs in clusters

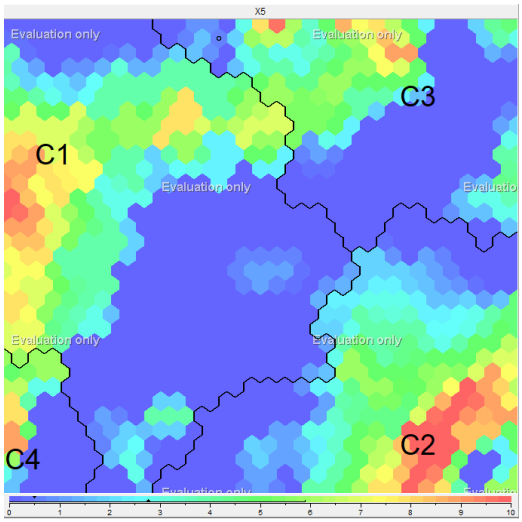

Figure 7. The distribution of verbs for security needs in clusters

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International Online Journal of Primary Education 2021, volume 10, issue 1

When Figure 8 is examined, it is seen that the verbs for aesthetic needs are not used frequently in clusters C1, C2, and C3, but they are used more frequently in cluster C4. When the data in Tables 15-16 are examined, it is seen that students who use the verbs for aesthetic needs more frequently play a statistically significant role in the formation of the C4 cluster.

When Figure 9 is examined, it is seen that the students who use the verbs for the need of self-actualization more frequently gather in C1. When Tables 9-10 are analyzed, it is seen that students who use verbs for this theme more frequently are statistically significant in forming C1. According to Tables 13-14, it is seen that the usage of verbs for self-actualization needs played a statistically significant role in the formation of the C3 cluster, but students used these verbs less.

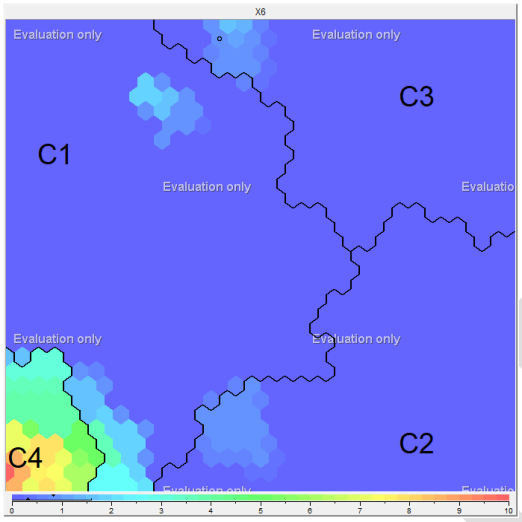

Figure 8. The distribution of verbs for aesthetic needs in clusters

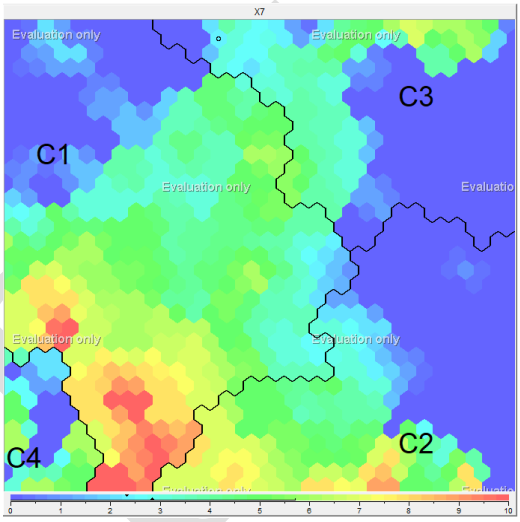

Figure 9. The distribution of verbs for self-actualization needs in clusters

When Figure 10 is examined, it is seen that the frequency of using the verbs for transcendence needs of students is low. The C2 cluster has red and green areas due to the usage of the more frequent verbs of some students. According to Tables 11-12, it is seen that the verbs of this theme are statistically significant in the formation of C2.

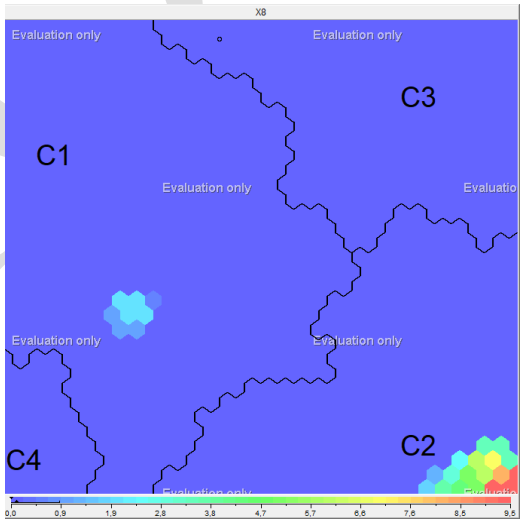

Figure 10. The distribution of verbs for transcendence needs in clusters

DISCUSSION and CONCLUSION

As a result of the evaluation of the study carried out for the pre-service primary school teachers to determine the most frequently used verbs in daily life in the order of priority and within the given period in the context of the hierarchy of the needs with SOM-Ward Cluster Analysis, it was observed that the verbs for biological-physiological needs were used by all students at a medium level. According to the students' similarity in the verbs they use more frequently, the SOM-Ward Cluster Analysis method was evaluated, and clusters were created by assembling similar students according to their attributes. When the four clusters formed in this way are examined, the following conclusions are reached:

The first cluster (C1) consists of students who use biological-physiological and self-realization needs more frequently. Considering that the realization levels of needs are also hierarchical according to Maslow's approach, the expected hierarchical progress did not occur despite the students forming the C1 cluster providing basic level proficiency; instead, there was a leap to the highest level that the individual prioritized. It reveals that students in C1 are selective after meeting their basic needs. The second cluster (C2) consists of students who use verbs for security and biological-physiological needs more frequently. Although those in this group have identified security needs first, there is not a significant difference compared to biological-physiological needs. However, awareness has been raised in the identification and hierarchy of needs. The third cluster (C3) consists of students who use verbs more about love and belonging needs. The needs of the students in this cluster reflect a priority of individual preferences rather than a hierarchical structuring. It was also noteworthy that the love and belonging needs were significantly prioritized over biological-physiological needs in this cluster, while self-actualization needs were not felt. The fourth cluster (C4) consists of students who use the verbs for aesthetic needs more frequently. In this cluster, there was a situation which was in contradiction to the hierarchy of needs, where individual preferences come to the fore rather than the hierarchical approach of the needs. The preference of aesthetic needs in this cluster as the primary and sole choice, while making an obvious difference as they are never used in the other clusters, reveals the characteristic attitude of the individuals forming this cluster. The needs of the sample of the study are incompatible with Maslow's hierarchy of needs in general (Abdullah & Gallagher, 1995; Hagerty, 1998; Hofstede, 1980; Martinez, 2020; Montag et al., 2020; Mousavi & Dargahi, 2013; Nair, 2020; Nevis, 1983; Rama et al., 2020; Taormina & Gao, 2013; Ye et al., 2015). The reason for it may be the change in prior needs of pre-service primary school teachers, the prior needs of individuals of Turkish culture or the prior needs of our age.

The approach put forward by Maslow's hierarchy of needs is compatible with cluster C1 in our study, although the expected stages do not follow the most basic need; biological and physiological needs were preferred, and then personal preferences of individuals were prioritized in determining the needs.

According to the pyramid, those in the clusters of C2, C3 and C4 do not comply with the theoretical approaches proposed in the context of the hierarchy of needs; individual preferences take priority over the hierarchical approach in determining needs. It has been observed that the safety, love-belonging and aesthetic needs of those who form these clusters are beyond the basic needs step. It reveals that there can be greater and higher priority needs in an individual's life other than biological and physiological needs.

It was determined that the needs of esteem and transcendence did not play an important role in the clusters since they did not make a significant difference. It suggests that the individuals involved in the study do not adequately reflect the verbs based on the need for esteem or transcendence in their daily lives, and this situation has negative effects on professional life and social life.

According to results of the study, the following suggestions could be implemented: The deficiencies in the most basic needs in the hierarchy of needs should be met in those whose experience a lack in these needs; activities such as courses, seminars, and social events on an institutional basis should be developed in order to overcome the deficiencies in the need for self-actualization; solutions for issues such as safety, law, stability, fearlessness, and shelter should be found to address the security concerns

of those who make the first step of the hierarchy such concerns by identifying the need for security as a priority; the reason why the need for respect is hardly mentioned should be examined and an awareness that this is a need and significant value in education, professional life, and society should be created, and attitudes and behaviors which support it should be developed; the need for superiority, which is not found in the clusters and which constitutes a significant deficiency in the students' individual lives should be met through efforts that make individuals aware of values beyond their own self in various fields such as mystical experiences, nature-related experiences, aesthetic experiences, service to others, science engagement, and belief.

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